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B. Webb
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Kenten, J. et al.
Serial No.	:	09/480,544
Filed	:	January 10, 2000
For	:	CYCLING DNA/RNA AMPLIFICATION ELECTROCHEMILUINESCENT PROBE ASSAY
Group Art Unit	:	1655
Examiner	:	A. Chakrabarti

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Barry Evans, Reg. No. 22,802
Name of Applicant, Assignee or Registered Representative

Barry Evans
Signature

December 14, 2001
Date of Signature

BOX RCE

Commisioner for Patents
Washington, D.C. 20231

AMENDMENT

Sir:

In response to the Final Official Action mailed November 20, 2000, Applicants respectfully request entry of the enclosed Request for Continued Examination (RCE) under 37 CFR § 1.114 and the following amendment. A notice of appeal was filed on May 18, 2001 and a

petition for a five (5) month extension of time from July 18, 2001 to December 18, 2001 is enclosed.

IN THE CLAIMS:

Please cancel claims 21-31, all of the claims in this application.

Enter the following new claims:

32. A process for the detection of a specific nucleic acid sequence, comprising:

(a) forming a composition comprising

(i) the sample,

(ii) a first oligonucleotide primer which comprises a promoter sequence,

(iii) a second oligonucleotide primer,

(iv) a DNA-directed RNA polymerase,

(v) an RNA-directed DNA polymerase,

(vi) a DNA-directed DNA polymerase, and

(vii) a ribonuclease that hydrolyzes RNA of an RNA-DNA hybrid without hydrolyzing single or double-stranded RNA or DNA;

(b) incubating the reaction mixture for a sufficient time to amplify said specific nucleic acid sequence to form an amplified nucleic acid sequence mixture comprising an amplified nucleic acid sequence;

(c) forming a second mixture by adding to a sample of said amplified nucleic acid sequence mixture the following reagents

(i) at least one detection probe sequence which specifically hybridizes to said amplified nucleic acid sequence, said detection probe sequence being labeled with an electrochemiluminescent species,

(ii) at least one capture probe sequence which specifically hybridizes to said amplified nucleic acid sequence, said capture probe sequence being labeled with a binding species, and

(iii) a solid phase coated with a binding partner of said binding species;

(d) incubating said second mixture for a time sufficient to allow hybridization of said probes to said amplified nucleic acid sequence and to allow binding of said binding species to said binding partner so as to form a solid phase-bound hybridization complex; and

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(e) detecting said solid phase-bound complex by using said electrochemiluminescent species.

33. The process of claim 1, wherein the solid phase is a magnetic bead.

34. The process of claim 1, wherein the binding species/binding partner pair are selected from the group consisting of biotin/avidin, biotin/streptavidin, and digoxigenin/anti-digoxigenenin.

35. The process of claim 1, wherein the binding species is biotin and the solid phase is a streptavidin-coated magnetic bead.

36. The process of claim 1, wherein said amplified nucleic acid sequence is the anti-sense copy of the specific nucleic acid sequence and wherein said amplification of said specific nucleic acid sequence is carried out under conditions which permit

(i) said second oligonucleotide primer to hybridize to an RNA template which comprises the specific nucleic acid sequence or an anti-sense copy of the specific nucleic acid sequence,

(ii) said RNA-directed DNA polymerase to utilize said RNA template to synthesize a DNA template by extension of said second oligonucleotide primer and thereby form an RNA-DNA hybrid intermediate,

(iii) said ribonuclease to hydrolyze RNA contained in said RNA-DNA hybrid intermediate,

(iv) said first oligonucleotide primer to hybridize to said DNA template,

(v) said DNA-directed DNA polymerase to utilize said DNA template to synthesize a double-stranded DNA product by extension of said first olignucleotide primer, said double stranded DNA product comprising said promoter, and

(vi) said DNA-directed RNA polymerase to recognize said promoter and transcribe said double stranded DNA product so as to form more RNA first template.

37. The process of claim 1, wherein said electrochemiluminescent species comprises ruthenium-*tris*-bipyridine.

38. A process for the detection of a specific nucleic acid sequence, comprising:

(a) forming a composition comprising:

(i) the sample,

(ii) a first oligonucleotide primer which comprises a promoter sequence,

(iii) a second oligonucleotide primer,

(iv) a DNA-directed RNA polymerase,

(v) an RNA-directed DNA polymerase,

(vi) a DNA-directed DNA polymerase,

(vii) a ribonuclease that hydrolyzes RNA of an RNA-DNA hybrid without hydrolyzing single or double-stranded RNA or DNA, and

(viii) one or more nucleotides;

(b) incubating the reaction mixture for a sufficient time to amplify said specific nucleic acid sequence to form an amplified nucleic acid sequence mixture comprising an amplified nucleic acid sequence;

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(c) forming a second mixture by adding to a sample of said amplified nucleic acid sequence mixture the following reagents

(i) at least one detection probe sequence which specifically hybridizes to said amplified nucleic acid sequence, said detection probe sequence being labeled with an electrochemiluminescent species,

(ii) at least one capture probe sequence which specifically hybridizes to said amplified nucleic acid sequence, said capture probe sequence being labeled with a binding species, and

(iii) a solid phase coated with a binding partner of said binding species;

(d) incubating said second mixture for a time sufficient to allow hybridization between said probes and to allow binding of said binding species to said binding partner so as to form a solid phase-bound hybridization complex; and

(e) detecting said solid phase-bound complex by using said electrochemiluminescent species;

wherein, optionally, said first primer, second primer or at least one of said nucleotides is labeled with the electrochemiluminescent species and said detection probe is omitted, and, optionally, said first primer, second primer or at least a portion of said nucleotides is labeled with the binding species and said capture probe is omitted.

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39. The process of claim 7, wherein the solid phase is a magnetic bead.

40. The process of claim 7, wherein the binding species/binding partner pair are selected from the group consisting of biotin/avidin, biotin/streptavidin, and digoxigenin/anti-digoxigenenin.

41. The process of claim 7, wherein the binding species is biotin and the solid phase is a streptavidin-coated magnetic bead.

42. The process of claim 7, wherein said amplified nucleic acid sequence is the anti-sense copy of the specific nucleic acid sequence and wherein said amplification of said specific nucleic acid sequence is carried out under conditions which permit

(i) said second oligonucleotide primer to hybridize to an RNA template which comprises the specific nucleic acid sequence or an anti-sense copy of the specific nucleic acid sequence,

(ii) said RNA-directed DNA polymerase to utilize said RNA template to synthesize a DNA template by extension of said second oligonucleotide primer and thereby form an RNA-DNA hybrid intermediate,

(iii) said ribonuclease to hydrolyze RNA contained in said RNA-DNA hybrid intermediate,

(iv) said first oligonucleotide primer to hybridize to said DNA template,

(v) said DNA-directed DNA polymeráse to utilize said DNA template to synthesize a double-stranded DNA product by extension of said first olignucleotide primer, said double stranded DNA product comprising said promoter, and

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(vi) said DNA-directed RNA polymerase to recognize said promoter and transcribe said double stranded DNA product so as to form more RNA first template.

43. The process of claim 7, wherein said electrochemiluminescent species comprises ruthenium-*tris*-bipyridine.

REMARKS

A Request for Continued Examination (RCE) is submitted to further prosecution.

All of the claims have been cancelled and replaced with new claims 32-43.

The rejections of the claims under 35 U.S.C. §101 for statutory double patenting and the judicially created doctrine of obviousness-type double patenting for the reasons set forth in paragraphs 2, 3, and 4 of the Official Action are respectfully traversed for the reason that all of the new claims do not claim the same invention as U.S. Patent No. 6,048,687 (the '687 patent) issued on April 11, 2000, nor render the present invention obvious in view of the '687 patent.

Favorable reconsideration of this application is respectfully requested.

Respectfully submitted,

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